



“In doing so, we were able to demonstrate for the first time a manganese limitation for phytoplankton growth in the center of Drake Passage. Closer to shore, iron was the limiting factor, as expected,” Dr. Browning reports.

After the expedition, the team used additional model calculations to assess the implications of the experimental results. Among other things, they found that manganese limitation may have been even more widespread during the ice ages than it is today. “This would make this previously unaccounted for factor a central part of understanding the ice ages,” says Dr. Browning.

However, because this is the first record in a specific region of the Southern Ocean, further research is needed to better understand the geographic extent and timing of manganese limitation in the Southern Ocean. “We also still need to study what factors control manganese concentrations in seawater and how phytoplankton adapt to manganese scarcity. All of this is critical to building more accurate models of how the Earth system works,” Thomas Browning concludes.

Reference:

Browning, T. J., E. P. Achterberg, A. Engel, E. Mawji (2021): Manganese co-limitation of phytoplankton growth and major nutrient drawdown in the Southern Ocean. Nature Communications, <https://doi.org/10.1038/s41467-021-21122-6>

Links:

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Images:

At [www.geomar.de/n7657-e](http://www.geomar.de/n7657-e) images are available for download.

Contact :

Jan Steffen (GEOMAR, Communication and Media), Tel.: +49 0431 600-2811, [presse@geomar.de](mailto:presse@geomar.de)